

## **REMARKS**

With the cancellation of claim 32 and the addition of claims 41 and 42, claims 21 to 23, 25 to 26, 28 to 31 and 34 to 42 are now pending in the present application. Claims 21, 30, 34, 38 and 39 have been amended. Applicants respectfully submit that the pending claims are patentable for the following reasons.

### **I. Rejection of Claims 21 to 23, 25, 26, 29 to 32, 37 and 40**

Claims 21 to 23, 25, 26, 29 to 32, 37 and 40 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over United States Patent No. 6,051,503 ("Bhardwaj et al.") in view of United States Patent No. 6,277,173 ("Sadakata et al.") and Applicants' allegedly admitted prior art (AAPA). It is respectfully submitted that the combination of Bhardwaj et al., Sadakata et al. and the AAPA does not render these claims unpatentable for the following reasons.

Claim 21 relates to a method for anisotropically etching structures into a substrate positioned in an etching chamber, including: providing an etching mask on a silicon substrate positioned in the etching chamber; and providing the etching chamber at least intermittently with an etching gas and at least intermittently with a passivation gas. The passivation gas is supplied to the etching chamber in cycles each having a time period between 0.05 second and 1 second. The etching gas and the passivation gas are used alternately during separate etching steps and passivation steps that are controlled independently of one another, the passivation gas being supplied to the etching chamber substantially only during the passivation steps, and the etching gas being supplied to the etching chamber substantially only during the etching steps. The duration of the passivation steps is set to be shorter than the duration of the etching steps by a factor of 10 to 30.

Claim 21 has now been amended to include, inter alia, some of the features of claim 32. Accordingly, claim 32 has been canceled, and claims 38 and 39, which both depend from claim 32, have now been amended to depend from claim 30. Claim 21, as amended, recites, in relevant parts, that **a passivation gas line is provided upstream from the etching chamber, a buffer tank is located along the passivation gas line upstream from the**

etching chamber, a passivation gas valve is located downstream from the buffer tank and upstream from the etching chamber, and an etching gas line is provided upstream from the etching chamber. The passivation gas line and the etching gas line one of: a) connect directly into the etching chamber; and b) connect directly into a common feed line upstream from the etching chamber. The common feed line feeds into the etching chamber. All of the passivation gas supplied to the etching chamber passes through the passivation gas line and the buffer tank.

Neither Bhardwaj et al., nor Sadakata et al. disclose or suggest that a buffer tank is located along a passivation gas line upstream from an etching chamber, and that all of the passivation gas supplied to the etching chamber passes through the passivation gas line and the buffer tank. On page 3, lines 15 to 16, the Final Office Action admits that Bhardwaj et al. is silent about the use of a buffer tank located along a passivation gas line. On the other hand, Sadakata et al. do describe a buffer tank and associated valves. However, the buffer tank of Sadakata et al. is not located along a passivation gas line, but along a line dedicated to starting gas and gases recycled after passing through a detoxification unit in an exhaust line of a manufacturing apparatus. In addition, in the embodiment of a system shown in Figure 2 of Sadakata et al., the gas supplied to manufacturing apparatus 1 does not all pass through one gas line and buffer tank 26. Instead, gas from gas compressor 24 and starting gas enter buffer tank 26 from two different lines, and gas supplied to manufacturing apparatus 1 enters the apparatus from line 29 and a process gas line. Furthermore, in the embodiment of a system shown in Figure 5 of Sadakata et al., although buffer tank 51 is situated upstream from manufacturing apparatus 1 and all of the gas supplied to manufacturing apparatus 1 flows through buffer tank 51, the buffer tank 51 is supplied by three different lines, i.e., line 29 from buffer tank 26 and two concentration adjusting gas lines 53. Therefore, buffer tank 51 cannot be said to be located along a single passivation gas line, through which all of the gas supplied to manufacturing apparatus 1 flows. Moreover, the motivation for combining the disclosures of Bhardwaj et al. and Sadakata et al., provided from page 3,

line 19 to page 4, line 2 of the Final Office Action - namely, to regulate the concentration of gas into a process chamber during etching - is untenable for the following reasons. First of all, in the reactor of Bhardwaj et al., there is no indication that any source of process gases is providing these gases at a concentration that is unknown or fluctuating. Therefore, one skilled in the art would not need to employ a buffer tank to regulate the concentration of process gases. Secondly, claim 21 as amended provides that a buffer tank is located along a passivation gas line upstream from an etching chamber, and that all of the passivation gas supplied to the etching chamber passes through the passivation gas line and the buffer tank. If all of the passivation gas supplied to the etching chamber passes through a buffer tank and a passivation gas line along which the buffer tank is situated, then it is impossible for the buffer tank to regulate the concentration of gas into the etching chamber, for the buffer tank is only supplied by one gas line, namely, the passivation gas line, and all of the gas exiting the buffer tank is supplied to the etching chamber. Thirdly, in the *KSR* decision, the Supreme Court identified a number of rationales that might support a conclusion of obviousness. Among the rationales identified by the Supreme Court are: (a) combining prior art elements according to known methods to yield predictable results; (b) simple substitution of one known element for another to obtain predictable results; (c) use of known technique to improve similar devices (methods, or products) in the same way; (d) applying a known technique to a known device (method, or product) ready for improvement to yield predictable results; (e) "Obvious to try" -- choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success; (f) known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art; and (g) some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention. The Final Office Action has not sufficiently identified what rationale is relied upon in connection with the present rejection and has failed to articulate the necessary findings to support any such rationale. As a final point, the AAPA does not cure the

deficiencies of Bhardwaj et al. and Sadakata et al. with respect to at least the above-mentioned features. Accordingly, it is respectfully submitted that the combination of Bhardwaj et al., Sadakata et al. and the AAPA does not render claim 21 unpatentable for at least these reasons.

Claim 30 includes features analogous to claim 21 and has been amended in a manner analogous to claim 21. In addition, claim 34 has been amended to correct an obvious error and to conform with the amendments made to claim 30. Accordingly, it is respectfully submitted that the combination of Bhardwaj et al., Sadakata et al. and the AAPA does not render claim 30 unpatentable for at least the reasons set forth above in support of the patentability of claim 21.

As mentioned above, claim 32 has been canceled without prejudice, thereby rendering moot the rejection with respect to this claim.

As for claims 22, 23, 25, 26 and 29 and claims 31, 37 and 40, which respectively depend from, and therefore include all of the features of, claims 21 and 30, it is respectfully submitted that the combination of Bhardwaj et al., Sadakata et al. and the AAPA does not render these dependent claims unpatentable for at least the reasons set forth above.

In view of all of the foregoing, withdrawal of this rejection is respectfully requested.

## **II. Rejection of Claim 28**

Claim 28 was rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bhardwaj et al. in view of Sadakata et al., the AAPA and U.S. Patent Application Publication No. 2003/0059720 ("Hwang et al."). It is respectfully submitted that the combination of Bhardwaj et al., Sadakata et al., the AAPA and Hwang et al. does not render this claim unpatentable for the following reasons.

Claim 28 ultimately depends from claim 21 and therefore includes all of the features recited in claim 21. In addition, Hwang et al. do not disclose or suggest all of the features of claim 21 not disclosed or suggested by Bhardwaj et al., Sadakata et al. and the AAPA. Therefore, it is respectfully submitted that the combination of Bhardwaj et al., Sadakata et al., the AAPA and Hwang et al. does not render this dependent claim unpatentable for at least these

reasons and the reasons more fully set forth above in support of the patentability of claim 21.

In view of all of the above, withdrawal of this rejection is respectfully requested.

### **III. Rejection of Claims 34 to 36**

Claims 34 to 36 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bhardwaj et al. in view of Sadakata et al., the AAPA and United States Patent No. 6,846,745 ("Papasouliotis et al."). It is respectfully submitted that the combination of Bhardwaj et al., Sadakata et al., the AAPA and Papasouliotis et al. does not render these claims unpatentable for the following reasons.

Claims 34 to 36 ultimately depend from claim 30 and therefore include all of the features recited in claim 30. In addition, Papasouliotis et al. do not disclose or suggest all of the features of claim 30 not disclosed or suggested by Bhardwaj et al., Sadakata et al. and the AAPA. Therefore, it is respectfully submitted that the combination of Bhardwaj et al., Sadakata et al., the AAPA and Papasouliotis et al. does not render these dependent claims unpatentable for at least these reasons and the reasons more fully set forth above in support of the patentability of claim 30.

In view of all of the above, withdrawal of this rejection is respectfully requested.

### **IV. Rejection of Claims 38 and 39**

Claims 38 and 39 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Bhardwaj et al. in view of Sadakata et al., the AAPA and United States Patent No. 5,683,548 ("Hartig et al."). It is respectfully submitted that the combination of Bhardwaj et al., Sadakata et al., the AAPA and Hartig et al. does not render these claims unpatentable for the following reasons.

Claims 38 and 39 ultimately depend from claim 30 and therefore include all of the features recited in claim 30. In addition, Hartig et al. do not disclose or suggest all of the features of claim 30 not disclosed or suggested by Bhardwaj et al., Sadakata et al. and the AAPA. Therefore, it is respectfully

submitted that the combination of Bhardwaj et al., Sadakata et al., the AAPA and Hartig et al. does not render these dependent claims unpatentable for at least these reasons and the reasons more fully set forth above in support of the patentability of claim 30.

In view of all of the above, withdrawal of this rejection is respectfully requested.

**V. New Claims**

New claims 41 and 42 have been added herein. It is respectfully submitted that claims 41 and 42 add no new matter and are fully supported by the present application, including the Specification.

Since claims 41 and 42 depend from claims 21 and 30, respectively, it is respectfully submitted that claims 41 and 42 are allowable for at least the reasons set forth above in support of the patentability of claims 21 and 30, respectively.

**VI. Conclusion**

In view of the foregoing, it is respectfully submitted that all pending claims of the present application are now in condition for allowance. Prompt reconsideration and allowance of the present application are therefore earnestly solicited.

Respectfully submitted,

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